

- 19 -

CLAIMS

We claim:

- 5 1. In a computer system, a method of displaying high dynamic range digital images on a display, the method comprising:
 receiving high dynamic range image information, wherein the high dynamic range image information defines a high dynamic range image;
 receiving region of interest information, the region of interest information
10 defining one or more regions of the high dynamic range image;
 displaying a background image constructed from the high dynamic range image information, along with one or more portions of the high dynamic range image corresponding to the one or more regions, the one or more portions of the high dynamic range image displayed in accordance with at least one display parameter that
15 differs from a corresponding display parameter for the background image.
2. The method of claim 1 wherein the received region of interest information is generated by a user via a graphical user interface.
- 20 3. The method of claim 1 wherein the at least one display parameter that differs from the corresponding display parameter for the background image is determined by a user.
4. The method of claim 1 wherein the high dynamic range image
25 information consists of information stored in a single image file.
5. The method of claim 1 wherein the high dynamic range image information comprises plural images.

- 20 -

6. The method of claim 5 wherein each of the plural images have a narrower dynamic range than the high dynamic range image.

5 7. The method of claim 5 wherein each of the plural images have differing dynamic ranges.

8. The method of claim 1 wherein the displaying comprises performing a geometric transform of the background image, along with one or more portions of the high dynamic range image corresponding to the one or more regions.
10

9. The method of claim 1 wherein the displaying comprises performing a geometric transform of the one or more portions of the high dynamic range image corresponding to the one or more regions.

15 10. The method of claim 1 wherein the displaying comprises blending the background image with the one or more portions of the high dynamic range image corresponding to the one or more regions.

20 11. The method of claim 1 wherein the at least one display parameter that differs from the corresponding display parameter for the background image is a tone mapping parameter.

25 12. The method of claim 1 wherein the at least one display parameter that differs from the corresponding display parameter for the background image is a cached image parameter.

13. The method of claim 1 wherein the at least one display parameter that differs from the corresponding display parameter for the background image is adjustable in real time.

- 21 -

14. The method of claim 1 further comprising repeating the acts of claim 1 for a plurality of different high dynamic range images.

15. A computer-readable medium having stored thereon computer-executable instructions for causing a computer to perform the method of claim 1.

16. In a computer system, a method of displaying one or more high dynamic range digital images on a display, the method comprising:
receiving high dynamic range image information defining a high dynamic range image;
receiving region of interest information, the region of interest information defining one or more regions of the high dynamic range image;
determining an intermediate image for the high dynamic range image based on image data in the one or more regions of the high dynamic range image, the intermediate image having a narrower dynamic range than the high dynamic range image; and
displaying the intermediate image on the display.

17. The method of claim 16 wherein the display has a narrower dynamic range than the high dynamic range image, and wherein the intermediate image has a dynamic range equal to the dynamic range of the display.

18. The method of claim 16 wherein the intermediate image has a narrower dynamic range of exposure levels than the high dynamic range image.

19. The method of claim 16 wherein the intermediate image has a narrower dynamic range of wavelengths than the high dynamic range image.

20. The method of claim 16 wherein the intermediate image has a narrower dynamic range of color saturation levels than the high dynamic range image.

- 22 -

21. The method of claim 16 further comprising:
after the receiving high dynamic range image information, processing the high
dynamic range image information to yield processed image information; and
5 constructing the intermediate image using the processed image information.

22. The method of claim 21 further comprising storing the intermediate
image in an image cache.

10 23. The method of claim 16 wherein the intermediate image is a tone-
mapped version of the high dynamic range image.

24. The method of claim 23 wherein the tone-mapped version has a
dynamic range of exposure levels that differs from the dynamic range of exposure
15 levels for the high dynamic range image.

25. The method of claim 16 wherein the intermediate image is a segmented
version of the high dynamic range image.

20 26. The method of claim 25 wherein at least one of the one or more regions
is a segment defined in the segmented version of the high dynamic range image.

27. The method of claim 16 wherein the intermediate image is retrieved
from an image cache prior to the displaying.

25

28. The method of claim 16 wherein the displaying the intermediate image
comprises displaying a derived image, the derived image comprising:
a background image; and
a portion of the intermediate image defined by one of the one or more regions.

30

- 23 -

29. The method of claim 28 wherein the intermediate image is compressed using a first compression method and the background image is compressed using a different compression method.

5 30. The method of claim 28 wherein a color space for the intermediate image differs from a color space for the background image.

31. The method of claim 28 wherein the one of the one or more regions is a rectangular region.

10

32. The method of claim 31 wherein the rectangular region can be positioned by a user acting through a graphical user interface.

33. The method of claim 16 further comprising displaying a second
15 intermediate image in a derived image, the derived image comprising:
a background image; and
at least one portion of each of the two intermediate images, each portion defined by at least one of the one or more regions.

20 34. The method of claim 16 further comprising displaying a second intermediate image and a third intermediate image in a derived image, the derived image comprising:
a background image; and
at least one portion of each of the three intermediate images, each portion
25 defined by at least one of the one or more regions.

35. The method of claim 16 wherein the high dynamic range image is a video image in a video image sequence.

- 24 -

36. The method of claim 16 wherein the high dynamic range image is a three-dimensional image.

5 37. A computer system comprising:
a processor; and
a storage having stored therein computer-executable instructions to implement a high dynamic range image viewer operable to output to a display one or more images based on one or more selected regions of interest in the one or more high dynamic range images.

10

38. The computer system of claim 37 further comprising an image output device for visually displaying digital images.

15 39. The computer system of claim 37 wherein the high dynamic range image viewer comprises a derived image constructing module.

40. The computer system of claim 37 wherein the high dynamic range image viewer comprises a graphical user interface module.

20 41. The computer system of claim 37 wherein the high dynamic range image viewer comprises an image pre-processor for creating one or more intermediate images based on the input high dynamic range image information.

25 42. The computer system of claim 37 further comprising a cached image storage for storing cached images.

43. A computer-readable medium having computer-executable code for implementing a software system for displaying high dynamic range digital images on a display, the software system comprising:

- 25 -

means for receiving high dynamic range image information defining a high dynamic range image;

means for receiving region of interest information, the region of interest information defining one or more regions of the high dynamic range image;

5 means for determining an intermediate image for the high dynamic range image based on image data in the one or more regions of the high dynamic range image, the intermediate image having a narrower dynamic range than the high dynamic range image; and

means for causing a computer to display the intermediate image on the display.

10

44. A computer-readable medium having computer-executable code for implementing a software system for displaying high dynamic range digital images on a display, the software system comprising:

15 means for receiving high dynamic range image information, wherein the high dynamic range image information defines a high dynamic range image;

means for receiving region of interest information, the region of interest information defining one or more regions of the high dynamic range image;

20 means for causing a computer to display a background image constructed from the high dynamic range image information, along with one or more portions of the high dynamic range image corresponding to the one or more regions, the one or more portions of the high dynamic range image displayed in accordance with at least one display parameter that differs from a corresponding display parameter for the background image.

25 45. In a computer system, a method of displaying high dynamic range digital images during image editing, the method comprising:

receiving high dynamic range image information, wherein the high dynamic range image information defines a high dynamic range image;

- 26 -

receiving region of interest information generated by a user, the region of interest information defining one or more user-selected regions of the high dynamic range image;

- 5 displaying a background image constructed from the high dynamic range image information, along with one or more portions of the high dynamic range image corresponding to the one or more user-selected regions, wherein the one or more portions are displayed with a tone mapping parameter that differs from a corresponding parameter for the background image to facilitate application of tone mapping to the high dynamic range image during image editing.